and

an offset voltage generator, connected to said second arithmetic operation unit, generating an offset cancel voltage in order to cancel said offset voltage in accordance with said addition result and supplying said offset cancel voltage to said A/D converter.

26. (TWICE AMENDED) A signal processor for receiving data information as an analog signal and processing said analog signal, comprising:

an A/D converter converting said analog signal to a digital signal; and

an offset cancel circuit, connected to said A/D converter, supplying a voltage to cancel an offset voltage of said A/D converter, said offset cancel circuit including,

a comparator receiving said digital signal, and determining whether said digital signal is within a predetermined offset value range, which defines allowable offset values, to output a first comparison result and a second comparison result;

a first arithmetic operation unit, connected to said comparator, calculating an offset change based on said first comparison result and an offset unit change;

a second arithmetic operation unit, connected to said comparator, accumulating said offset change amount and outputting an addition result based on said second comparison result; and

an offset voltage generator, connected to said second arithmetic operation unit, generating an offset cancel voltage in order to cancel said offset voltage in accordance with said addition result and supplying said offset cancel voltage to said A/D converter.

27. (TWICE AMENDED) A signal processor for processing a data information signal and a servo information signal, both read from a recording medium, said signal processor comprising:

a servo information processing circuit processing servo information; and

a data information processing circuit, connected to said servo information processing circuit, receiving data information as an analog signal and processing said analog signal, said data information processing circuit includes,

A) an A/D converter receiving said analog signal from an input terminal and converting said analog signal to a digital signal, to output said digital signal from an output terminal;

B) a switch connected to said input terminal of said A/D converter; and

C) an offset cancel circuit, connected between said input terminal and an output terminal of said A/D converter, supplying a voltage to cancel an offset voltage of said A/D converter, said offset cancel circuit includes,

C1) a control circuit, connected to said switch, setting said switch off to inhibit supply of said analog signal to said A/D converter when said servo information processing circuit is performing a servo information process,

C2) a comparator connected to said comparator, receiving said digital signal and determining whether said digital signal is within a predetermined offset value range, which defines allowable offset values, to output a first comparison result and a second comparison result,

C3) a first arithmetic operation unit, connected to said comparator, calculating an offset change amount based on said first comparison result and an offset unit change,

C4) a second arithmetic operation unit, connected to said comparator, accumulating said offset change amount and outputting an addition result based on said second comparison result, and

C5 an offset voltage generator connected to said second arithmetic operation unit, generating an offset cancel voltage for canceling said offset voltage in accordance with said addition result and supplying said offset cancel voltage to said A/D converter.

28. (TWICE AMENDED) The signal processor according to claim 27, further comprising:

D) an amplifier, connected to said input terminal of said A/D converter and said control circuit, amplifying said analog signal and said offset cancel voltage by a first amplification factor, wherein said amplifier amplifies said offset cancel voltage by a second amplification factor which is higher than said first amplification factor,

wherein said second arithmetic operation unit has a reduced offset change amount inversely proportional to an increase ratio of said first amplification factor to said second amplification factor, and wherein said control circuit is connected to said comparator and said second arithmetic operation unit, and

wherein when said digital value lies within said predetermined offset value range, said control circuit controls said amplifier in such a way as to amplify said offset cancel voltage by

C1 said second amplification factor and controls said second arithmetic operation unit to perform addition based on said reduced offset change amount.

34. 15 (TWICE AMENDED) A method of canceling an offset voltage of an A/D converter for converting an analog signal to a digital signal, said method comprising:

C2 determining whether said digital signal is within a predetermined offset value range, which defines allowable offset values, to generate a comparison result;

calculating an offset change amount based on said comparison result and an offset unit change;

accumulating said offset change amount;

stopping said accumulating, to determine an accumulated offset change amount, when said digital value lies within said predetermined offset allowance value; and

generating an offset cancel voltage for canceling said offset voltage in accordance with said accumulated offset change amount.

63. 16 (ONCE AMENDED) A method of canceling an offset voltage of an A/D converter for converting an analog signal to a digital signal, said method comprising:

C3 determining whether said digital signal is within a predetermined offset value range, which defines allowable offset values, to generate a comparison result;

calculating an offset change amount based on said comparison result and an offset unit change;

accumulating said offset change amount; and

generating an offset cancel voltage for canceling said offset voltage in accordance with said accumulated offset change amount.

64. 17 (ONCE AMENDED) A circuit suitable for canceling an offset voltage of an A/D converter that converts an analog signal to a digital signal, said circuit comprising:

a comparator receiving said digital signal and comparing a digital value of said digital signal with a predetermined offset value to generate a first comparison result and a second comparison result;

a first arithmetic operation unit, connected to said comparator, calculating an offset change amount based on said first comparison result and an offset unit change;

a second arithmetic operation unit, connected to said comparator, accumulating said

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offset change amount and outputting an addition result based on said second comparison result, wherein said addition result is initialized to a predetermined initial value; and

an offset voltage generator, connected to said second arithmetic operation unit, generating an offset cancel voltage in order to cancel said offset voltage in accordance with said addition result and supplying said offset cancel voltage to said A/D converter.

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65. (ONCE AMENDED) A circuit suitable for canceling an offset voltage of an A/D converter that converts an analog signal to a digital signal, said circuit comprising:

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a comparator to receive said digital signal and compare a digital value of said digital signal with a predetermined offset value to generate a comparison result;

a first arithmetic operation unit, connected to said comparator, calculating an offset change amount based on said comparison result and an offset unit change;

a second arithmetic operation unit, connected to said comparator, to calculate a value of the changed amount of offset between the digital value and predetermined offset value, and output a result; and

an offset voltage generator, connected to said second arithmetic operation unit, to generate an offset cancel voltage to cancel said offset voltage in accordance with the result, and supply said offset cancel voltage to said A/D converter.

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66. (NEW) The circuit according to claim 25, wherein said first arithmetic operation unit multiplies said offset unit change by the first comparison result.

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67. (NEW) A circuit suitable for canceling an offset voltage of an A/D converter that converts an analog signal to a digital signal, wherein the A/D converter is connected to a gain control amplifier that amplifies the analog signal with a normal first amplification factor or a second amplification factor, said circuit comprising:

a comparator receiving said digital signal and determining whether said digital signal is within a predetermined offset value range, which defines allowable offset values, to output a comparison result;

a control circuit, connected to said comparator, generating a first control signal and a second control signal;

an arithmetic operation unit, connected to said control circuit, accumulating an offset change amount and outputting an addition result based on said first control signal; and

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an offset voltage generator, connected to said arithmetic operation unit, generating an offset cancel voltage to cancel said offset voltage in accordance with said addition result and supplying said offset cancel voltage to said A/D converter, wherein the gain control amplifier switches the normal first amplification factor to the second amplification factor in response to said second control signal when said comparator determines that the digital signal is within the predetermined offset value range.

68. (NEW) The circuit according to claim 67, wherein said second amplification factor is greater than said normal first amplification factor.

69. (NEW) The circuit according to claim 67, further comprising a multiplier, connected to said comparator, calculating an offset change amount based on the comparison result and an offset unit change.

70. (NEW) A method of canceling an offset voltage of an A/D converter for converting an analog signal to a digital signal, wherein the A/D converter is connected to a gain control amplifier that amplifies the analog signal with a normal first amplification factor or a second amplification factor, said method comprising:

determining whether said digital signal is within a predetermined offset value range, which defines allowable offset values, to determine an offset change amount;

accumulating said offset change amount;

generating an offset cancel voltage for canceling said offset voltage in accordance with said accumulated offset change amount; and

switching the normal first amplification factor to the second amplification factor when the digital signal is within the predetermined offset value range.

71. (NEW) A circuit suitable for canceling an offset voltage of the A/D converter that converts an analog signal to a digital signal wherein the A/D converter is connected to a gain control amplifier that amplifies the analog signal with a normal first amplification factor or a second amplification factor, said circuit comprising:

a comparator receiving said digital signal and comparing a digital value of said digital signal with a predetermined offset value to generate a comparison result;

a control circuit, connected to said comparator, generating a first control signal and a